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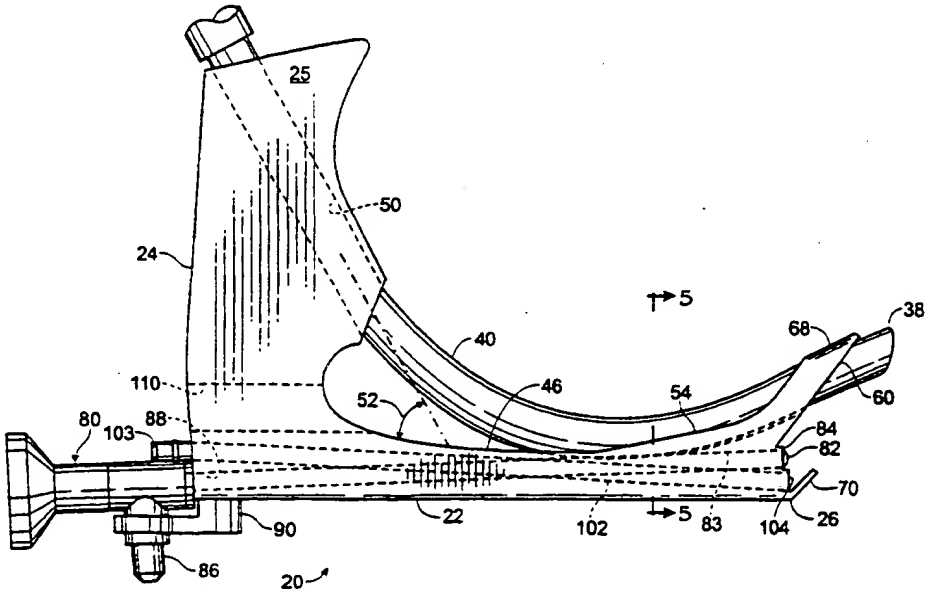

(57) Abstract

An intubation instrument, such as laryngoscope, comprises a body (20), an elongated arm (22) and a handle (24). The configuration of the instrument greatly facilitates safe placement of the instrument and an associated endotracheal tube (40). The arm (22) provides a path (46) for guiding movement of the endotracheal tube (40) in a manner that permits the distal end (38) of the tube (40) to move along the arm (22) directly toward the glottis (36). The elongated arm (22) includes a passage (83) into which a telescope (80) is mounted. The arrangement of the guide path (46) and passageway (56) ensures that the advancing end (38) of the tube (40) remains observable as it is advanced to the glottis. Suction is provided (102, 106) to remove fluid etc., that would otherwise obscure the view of the tube.

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INTUBATION INSTRUMENT

Technical Field

This invention relates to endoscopic instruments, particularly to an intubation instrument, such as a laryngoscope.

Background

Intubation of the human trachea is carried out daily in operating rooms and emergency facilities in order to facilitate respiration of a patient. The goal of the intubation process is to locate the distal end of an endotracheal tube in the larynx with the proximal end outside the patient's mouth.

Safe and effective intubation requires controlled insertion of the endotracheal tube so that the tube is directed to the upper part of the larynx, the glottis, without damaging or being blocked by the patient's tissue. To this end, intubation instruments have been developed. Such instruments generally provide a somewhat rigid structure that is inserted into the mouth of the patient so that the distal end of the instrument is located in the glottis, adjacent to the vocal cords. An endotracheal tube is slid through the instrument during or after insertion of the instrument.

Advanced intubation instruments provide a lighted telescope or fiber optic viewing device. The telescope is carried by the instrument with the objective lens located at the distal end of the instrument and arranged so that the user may, via the proximal, viewing end of the telescope, observe the advancement of the

instrument and the endotracheal tube. Such instruments are normally referred to as laryngoscopes.

In designing such intubation instruments it is important to provide a configuration that permits quick location of the instrument and tube without injurious or fatal delay that may occur with repeated attempts.

Precisely locating an endotracheal tube is certainly critical. Facial and neck trauma or the presence of blood, excoriation, mucus etc. may cause misdirection of the tube into the patient's esophagus.

Summary of the Invention

The present invention provides an intubation device that includes a configuration and arrangement of components that greatly facilitate rapid, safe placement of the instrument and associated endotracheal tube.

In accordance with one aspect of this invention, the instrument provides a path for guiding movement of the endotracheal tube in a manner that permits the distal end of the tube to move along the instrument directly toward the glottis. The instrument includes a passage into which a telescope is mounted. The arrangement of the guide path and passage ensures that the distal end of the tube remains observable as it is advanced to the glottis.

The observation of the movement of the instrument and tube is enhanced by the creation of a clearing at the distal end of the instrument. In this regard, the instrument includes structure for establishing a clearing at the distal end of the instrument, into which clearing the patient's tissue is prevented from entering.

The inner end of the telescope is located at this clearing, as well as advantageously placed suction tube(s) for ensuring that the clearing remains free of fluid and vapor that would otherwise obstruct the operator's view.

The structure used for establishing the clearing includes a protrusion that is configured to engage or lift the patient's epiglottis, thereby to expose the glottis. Moreover, a projecting guard is included for establishing the clearing. The guard is angled in a manner that permits smooth, sliding movement of the instrument across tissue to the desired, inserted position of the instrument.

In preferred embodiments of the invention, the instrument may include a second fluid passageway for delivering fluid to or from the distal end of the instrument. Moreover, the instrument can be configured to provide a channel for guiding secondary instruments, such as forceps, for clearly observed removal of foreign material in the larynx.

Other advantages and features of the present invention will become clear upon study of the following portion of this specification and drawings.

Brief Description of Drawings

FIG. 1 is a side, elevation view of a preferred embodiment of an instrument made in accordance with the invention shown carrying an endotracheal tube.

Fig. 2 is a front elevation view of the instrument shown with the endotracheal tube removed for clarity.

Fig. 3 is a bottom plan view of the instrument.

Fig. 4 is a top plan view of the instrument.

Fig. 5 is a cross section taken about line 5-5 of Fig. 1.

Fig. 6 is a side view of the instrument shown inserted into the mouth of a patient.

Fig. 7 is a perspective view of an alternative embodiment of an instrument formed in accordance with the present invention.

Fig. 8 is a cross-sectional view of the instrument, taken along line 8-8 of Fig. 7.

Best Modes for Carrying Out the Invention

With particular reference to Figs. 1 and 6, a preferred embodiment of an intubation instrument made and used in accord with the present invention includes a body 20 that generally comprises an elongated arm 22 with integrally attached handle 24. The instrument is preferably formed from metal or rigid plastic that can withstand sterilization.

The instrument arm has a distal end 26 that is inserted into the mouth 30 of a patient 28. Preferably, the instrument is inserted while the patient is recumbent, face-up, with the head tipped slightly backwardly, supported in what is known as the sniffing position. Before proceeding with the description of the instrument, it will be useful here to identify the relevant components of the human patient (Fig. 6).

As noted, the instrument is inserted, distal end 26 first. through the patient's mouth 30. As explained below, when properly inserted, the distal end of the endotracheal tube 40 resides in the hypopharynx 32. The patient's epiglottis 34 is supported by the instrument in a manner to expose the glottis 36. In the present invention, the instrument provides for the telescopically observed advance of the leading end 38 of an endotracheal tube 40 through the glottis 36, into the larynx 42 adjacent to the vocal cords 44. As is known in the art, an endotracheal tube 40 permits air to be conducted to and from an incapacitated patient. The present instrument includes a number of features that greatly increase the ease with which the instrument 20 and tube 40 can be properly located and continuously observed via a telescope or other optic device.

More particularly, the arm 22 of the instrument 20 is configured to define in the handle 24 and on its anterior surface 46 a guide path for the smooth advance of the tube 40 relative to the inserted instrument 20. For the purpose of this description, the anterior surface 46 of the instrument is, as shown if Fig. 6, that facing the lower jaw 48 of the intubated patient.

The guide path includes a portion consisting of a channel 50 (Fig.1) that is formed through the handle 24. It is noteworthy that the handle 24 extends in a generally perpendicular orientation relative to the elongated arm 22. The channel 50, however, extends through the handle 24 at a direction that is generally oblique to the length of the handle 24 and to the arm 22. Put another way, the channel orientation 50 is such that after the leading end of the tube 40 is advanced through the channel 50, it emerges to contact the anterior surface 46 of

the instrument at an acute angle 52 to slide along that surface toward the distal end 26 of the instrument.

Approaching the distal end of the instrument, the opposing anterior side edges 54 are gradually built up to define, in combination with the anterior surface part between the edges 54 a groove 56 that is generally curved in cross section, as best shown in Fig. 5. Preferably, the radius of curvature of the groove 56 generally conforms to the outside diameter of the tube 40. As such, the leading end of the tube 40 is precisely and smoothly guided through this groove 56, which makes up another part of the above mentioned guide path.

The side edges 54 terminate in a loop 60 that is part of the instrument and protrudes from the distal end 26 of the instrument at an angle of about 45 degrees relative to the length of the arm 22. As viewed from the end (Figs. 2 and 5), the loop defines an elongated opening 64 through which extends the leading end 38 of the tube 40.

Here it is useful to note that an endotracheal tube 40 used with the preferred embodiment of the instrument is formed of flexible plastic tubing. One such tube is that manufactured by Mallinckrodt, Inc. of St. Louis Missouri, under the trademark Mallinckroft. The tube is constructed to assume a curved configuration when relaxed, although it is readily deformed as needed. In the present invention, the loop 60 is configured to permit the leading end 38 of the tube 40 to approach its curved, relaxed configuration as it passes through and out of the loop 60.

More particularly, the elongated opening 64 (elongated, that is, in the direction away from the anterior surface of the arm 22, as shown in Figs 2 and 5) permits the flexible tube 40 to resile away from the distal end 26 of the arm 22 to seat against the underside 66 of the loop 60, as shown in Fig. 1. This underside 66 is curved to conform to the outside diameter of the tube, thereby providing, in a manner similar to the above-mentioned groove 56, precise and smooth guidance of the tube through the loop 60. Thus, the loop makes up another part of the above mentioned guide path. The advantages of the just described tube movement are discussed more fully below.

The loop 60 includes a surface 68 that bears against the patient's epiglottis 34 when the instrument is fully inserted. As a result, the epiglottis 34 and surrounding tissue are held by the instrument in a position where they do not occlude the glottis 36.

A guard 70 extends from the bottom of the instrument arm 22 at the distal end thereof. The guard is an extension of the arm 22 and is angled upwardly (as viewed in Figs. 1 and 6) to present an underlying surface that acts like a skid upon insertion of the instrument to permit the distal end of the instrument to be advanced against the patient's tissue without damage to the tissue. Thus, the guard 70 reduces the effort needed to insert the device, while protecting the patient's tissue.

Once the arm 22 is in place, the guard 70 serves to prevent the tissue in the hypopharynx 32 from contacting the distal end 26 of the arm 22 and obstructing the view available to a telescope 80 that is carried by the instrument.

In this regard, the telescope 80 is one that terminates in a long tubular member having an objective lens at its end 82. The terminus of the telescope fits into a telescope passage 83 that is formed through the arm 22. The telescope also includes a light post 86 that is mounted to the telescope 80 near the outer end 88 of the passage 83 and that provides illumination to the telescope 80. In a preferred embodiment of the instrument, a suitable telescope is one having approximately a 25-degree viewing angle; such as manufactured by Henke-Sass, Wolf of America Inc., Southbridge, Massachusetts, as model number 8853.42.

In a preferred embodiment of the invention the instrument is provided with a clip 90 that is mounted to the arm 22 near the outer end of the passageway 83. The clip 90 includes two spaced-apart, arched arms 92 that spread apart slightly to releasably receive between them the generally cylindrical shaped light post 86 as the telescope is slid into position relative to the instrument 22. The clip 90, therefore, serves to retain the telescope in the correct location and within the telescope passage 83 during use. Moreover, since the arms 92 of the clip engage a radial projection of the telescope (namely, the light post 86), the telescope is held against inadvertent rotation out of the desired orientation relative to the arm 22. The arms 92 of the clip 90 are resilient and readily move apart to release the light post 86 when the telescope is pulled from the instrument for replacement and cleaning.

Returning to consider the distal end 26 of the arm 22, the end 82 of the telescope 80 is located at the inner end 84 of the passage 83 when the telescope is installed. As noted, the guard 70 prevents tissue from contacting the end of

the telescope. More particularly, the telescope-guarding or tissue-retracting effect of both the loop 60 and the guard 70 has the effect of establishing a clearing 100 (Fig. 6), which is a space between the guard and loop, adjacent to the distal end of the instrument and free of view-obstructing tissue. The inner end 84 of the telescope passage (hence, the end 82 of an installed telescope) is in this clearing 100. Thus, the telescope is unaffected by tissue that would otherwise obstruct, at least in part, the telescopic view of the advancing, leading end 38 of the endotracheal tube 40.

As noted earlier, the loop 60 configuration is such that the tube that extends from the loop tends to assume its relaxed, curved shape. The leading end 38, therefore, tends to veer upwardly (considering Fig. 6) toward the glottis 36 and away from what would be a dangerous entry into the patient's esophagus 43.

The tube 40 is carried on the anterior surface 46 of the arm 22, between the patient's lower jaw and the telescope passage 83. This orientation, in combination with the curved guide path of the tube 40 ensure that the advancing, leading end 38 of the tube remains in the field of view of the telescope (as does the glottis) without crossing near the end 82 of the telescope, which crossing would obscure the view of the tube vis-a-vis the glottis 36.

For example, if the lens carried in the end 82 of the telescope is angled upwardly to provide a view in a direction toward the glottis 36, the movement of the tube end 38 out from beneath the underside of the loop 60 will be nearly parallel to a line defining the center of the field of view of the telescope. It has

been found that this relative positioning of the telescope end 82 and tube end 38 greatly enhances viewing of the advancing tube as compared to instruments that went before.

The preciseness with which the present instrument may be inserted enables one to supply, during insertion, intermittent pulses of air (positive pressure) through the tube 40 to provide immediate respiration to the patient during the insertion process. Thus, the conventional air or oxygen supply to the tube may be so connected and controlled during insertion of the instrument.

The clearing 100 would be susceptible to entry of fluids such as blood, exudate, mucus etc, which might be present in instances of neck trauma. In accord with another aspect of this invention, there is provided efficient suction removal of such matter. To this end, the arm 22 is provided with a passageway 102 having an interior end 104 that opens at the distal end 26 of the instrument, below the inner end 84 of the telescope passage 83. A suction tube 101 (Fig. 6) may be attached to a connector 103 that is mounted to the instrument at the outer end of the passageway 102. Suction is applied for removing any fluid that may begin to accumulate in the clearing 100. It is noteworthy that the instrument is arranged so that the inner end of the telescope passage is above (Fig. 1) the interior end 104 of the suction passageway 102. Thus, the end 104 of the suction passageway resides in what may be called a sump portion of the clearing 100. Unwanted fluids are removed before reaching a level that would obscure the end 82 of an installed telescope 80.

It is contemplated that suction would be applied to the clearing 100 even in the absence of view-obstructing fluids because the application of suction would tend to cool the telescope (which is heated by the light source) or remove vapor that might otherwise tend to condense on the lens of the telescope.

In a preferred embodiment, another passageway 106 (Fig. 5) is provided in the arm in a manner that substantially matches the suction passageway 102. This other passageway is available to hold another suction tube (thus enhancing overall suction of the clearing 100) or, alternatively, gas such as oxygen could be directed through this passageway 106 to increase the oxygen content of the glottis area.

The suction applied by one or both passages 102, 106 provides a vortex of fluid flow in the vicinity of the inner end 84 of the telescope passage, thereby providing a particularly effective way to remove from the telescope end (lens) 82 any fluid contamination, such as blood, that would otherwise obscure the view through the telescope. Thus, the telescope need not be removed for clearing the lens.

It will be appreciated that the arrangement of the various components of the instrument presents an instrument that is substantially symmetrical about the long axis of the arm and handle. Thus the instrument is readily useable by a right- or left-handed operator.

It is also contemplated that the channel 50 in the handle 24 may be configured to open on one side of the handle, such as surface 25 (Fig. 1) thereby

forming the channel 50 as a groove in the handle. As a result, the tube 40 could be inserted laterally into the channel/groove. At the junction of the channel 50 and surface 25, the groove width could be narrowed somewhat, relative to the remainder of the groove, to a width just slightly narrower than the diameter of the flexible tube 40. Such a configuration permits the tube to be secured by a snap-fit into this configuration of the channel.

While the present invention has been described in terms of a preferred embodiment, it will be appreciated by one of ordinary skill that the spirit and scope of the invention is not limited to those embodiments, but extend to the various modifications and equivalents as defined in the appended claims. For example, the above-described telescope could be replaced with a fiber optic device or a video camera. Moreover, additional channels could be provided for delivering other devices to the distal end of the instrument. Fig. 1 shows in dashed lines 110 such an alternative channel that would permit the advance of elongated forceps to the distal end of the instrument to be used, for example, in removing foreign objects from the larynx.

The instrument depicted in Figs. 7 and 8 illustrates alternative features as mentioned, and a few more. In this regard, the alternative embodiment in these figures shows a body 220 that generally comprises an elongated arm 222 with integrally attached handle 224. A channel 250, which is otherwise analogous to the channel 50 discussed above, opens on one side of the handle 224, thereby forming the channel 250 as a groove in the handle. As a result, the tube 40 (Fig. 5) could be inserted laterally into the channel/groove 250.

At the junction of the channel 250 and handle surface, the groove width is narrowed somewhat to a width just slightly narrower than the diameter of the flexible tube 40. Such a configuration permits the tube to be secured by a snap-fit into this configuration of the channel 250. Of course, the tube is free to slide longitudinally relative to the arm 222.

A similar lateral opening is provided for the above-mentioned alternative channel, here embodied as 210 in Fig. 7. Here, too, the groove opening at the side of the handle 224, is narrowed to a width just slightly narrower than the diameter of the instrument that is laterally inserted into the groove 210, thereby to permit the snap-fit noted above.

The embodiment of Figs. 7 and 8 also incorporates the lateral opening aspect in the configuration of the loop 260. Thus, the opening 264 of this loop is incomplete on one side, such that the loop 260 does not completely surround a tube 40 that fits through this opening. Nonetheless, the tube is held therein against lateral movement out of the opening 264 by the narrowing that forms a snap-fit configuration, as mentioned above.

The loop 260 includes a surface 268 that bears against the patient's epiglottis 34 when the instrument is fully inserted. As a result, the epiglottis 34 and surrounding tissue are held by the instrument in a position where they do not occlude the glottis 36. In this embodiment, the distance between the surface 268 and the underside 266 of the loop 260 is greater than that distance in earlier described embodiments. In this regard, the preferred distance in this embodiment matches about one diameter of the tube 40. As a result, as

compared to the earlier-described embodiment, more clearance is provided between the patient's epiglottis 34 and the tube 40 when the instrument is fully inserted. In this regard, the embodiment depicted in Figs. 7 and 8 also reflects a somewhat steeper angle (about 60 degrees) between the protruding loop 260 and the length of the arm 222.

Upon inspection of Figs. 7 and 8 one will appreciate that both the guard 270 and the loop 268 are more tapered and rounded as compared to those in the earlier described embodiment. In this embodiment, the relatively thin guard 270 is joined on one side to the loop 260 by a thin gusset 269 that protrudes distally from the loop 260 on one side of the body 222. In addition to supporting or stiffening the guard 270 relative to the loop 260, the gusset 269 helps maintain the clearing 200 (comparable to clearing 100 discussed above) free of tissue and the like. Moreover, the gusset 269 affects the distal or leading end of the instrument by presenting (see Fig. 8) a somewhat flat configuration to prevent tissue from being directed into the generally V-shaped junction 271 of the guard 270 and arm 222 as the instrument is advanced into position within the patient.

The telescope passageway 283 and suction port 202 of this embodiment are oriented to be parallel and both terminate in the vicinity of the earlier mentioned "sump" part of the distal end of the instrument. Another passageway 206 (which is akin to passageway 106 described earlier) is available to hold another suction tube (thus enhancing overall suction of the clearing 200) or, alternatively, to conduct gas such as oxygen through this passageway 206 to thereby increase the oxygen content of the glottis area. The distal end of this

passageway 206 is located between the loop opening 264 and the telescope passageway 283.

The proximal end 207 of the passageway 206 terminates on the side of the body 222, exposed there for easy connection without crowding the proximal connections of the telescope passageway 283 or suction passageway 202.

The handle 224 of the Figs. 7 and 8 embodiment is also provided with a recess to accommodate connection mechanisms, such as the clip 90 described above.

Claims

1. An intubation instrument, a portion of which is for insertion into a patient through the patient's mouth, comprising:

a body having a handle attached thereto;

an arm attached to the body, the arm having a distal end and being arranged for insertion distal-end first through the mouth of a patient and having an anterior surface that faces the lower jaw of a patient when the arm is inserted;

a telescope passage carried by the arm and having an inner end located at the distal end of the arm; and

a guide path formed on the anterior surface of the instrument body and configured for guiding the sliding movement of an endotracheal tube along the anterior surface between the telescope passage and the lower jaw of a patient into whom the arm is inserted.

2. The instrument of claim 1 wherein the guide path includes a loop protruding from the distal end of the arm, through which loop an endotracheal tube is extendable.

3. The instrument of claim 2 wherein the loop defines an elongated opening through which the endotracheal tube is extendable, the protruding loop being arranged so a leading end of the endotracheal tube is free to move away from the distal end of the arm while remaining in the opening.

4. The instrument of claim 3 wherein the portion of the loop opening away from the arm is shaped to conform to the outside diameter of the endotracheal

tube and wherein that portion of the opening combines with the remainder of the guide path away from the loop to permit the endotracheal tube to assume a curved orientation at the distal end of the arm.

5. The instrument of claim 2 wherein the arm is of a length such that the distal end of the arm is adjacent to the glottis of a patient when the arm is inserted and wherein the loop protrudes from the distal end of the arm by an amount sufficient to bear against the epiglottis of such patient.

6. The instrument of claim 1 further comprising a guard connected to the distal end of the arm and extending distally therefrom with respect to the inner end of the telescope passage thereby to prevent contact between the inner end of the telescope passage and tissue of a patient into whom the arm is inserted.

7. The instrument of claim 6 wherein the guide path includes a loop protruding from the distal end of the arm, through which loop a leading end of an endotracheal tube is extendable, the loop extending distally from the arm with respect to the inner end of the telescope passage so that adjacent to the inner end of the telescope passage there is established between the guard and the loop a clearing into which the patient's tissue is prevented from entry when the arm is inserted.

8. The instrument of claim 6 wherein the guard is angled relative to the arm in a direction toward the anterior surface of the arm thereby to facilitate insertion of the arm into the mouth of a patient.

9. The instrument of claim 1 further comprising a suction passageway formed in the arm and having an interior end located at the distal end of the arm such that the inner end of the telescope passage is substantially between the interior end of the suction passageway and the anterior surface of the arm.

10. The instrument of claim 9 further comprising a guard connected to the distal end of the arm and projecting distally therefrom with respect to the interior end of the suction passageway thereby to prevent contact between the interior end of the suction passageway and the tissue of a patient into whom the arm is inserted.

11. The instrument of claim 1 wherein the handle is an elongated member that is substantially perpendicular to the arm and wherein the guide path includes a channel formed in the handle and through which channel an endotracheal tube may fit, wherein the length of the channel extends in a direction oblique to the arm and the handle thereby to permit the tube to assume a curved orientation away from the handle and along the anterior surface of the arm.

12. The instrument of claim 11 wherein the body, arm, guide path and handle are arranged to be substantially symmetrical about the length of the instrument, thereby facilitating use of the instrument by an operator's right or left hand.

13. The instrument of claim 11 further comprising another channel formed in the handle, thereby to facilitate passage of a secondary instrument toward the distal end of the arm.

14. The instrument of claim 11 wherein the channel comprises a groove that opens to one side of the handle.

15. The instrument of claim 9 further comprising another passageway formed in the arm for conducting fluid to or from the distal end of the arm.

16. The instrument of claim 1 wherein the telescope passage includes an outer end through which a telescope may be passed into the telescope passage, the instrument including a clip mounted near the outer end for releasably retaining a telescope in the telescope passage.

17. The instrument of claim 16 wherein the clip includes arms that are arranged to engage a radially projecting part of the telescope, thereby to restrict rotation of the telescope relative to the telescope passage.

18. An intubation method comprising the steps of:

locating the distal end of an intubation instrument in the vicinity of a patient's glottis;

establishing at the distal end of the instrument a clearing into which the tissue of the intubated patent is prevented entry; and

locating the inner end of a telescope passage adjacent to the clearing so that the tissue is preventing from obstructing the inner end of the passage.

19. The method of claim 18 including the step of locating the interior end of a suction passageway adjacent to the inner end of the telescope passage thereby to remove fluids that may collect in the clearing.

20. The method of claim 18 wherein the locating step includes the step of extending part of the instrument to bearing against the patient's epiglottis, thereby to define the clearing and expose the glottis.

21. The method of claim 18 wherein the locating step includes the step of providing on the instrument a guard that projects from the distal end of the instrument and that is angled for facilitating sliding of the distal end of the instrument along tissue as the instrument is located in the patient.

22. The method of claim 18 wherein the step of locating the distal end of an intubation instrument in the vicinity of a patient's glottis includes the steps of:

providing on the instrument a tube;

inserting the instrument and tube through the patient's mouth; and

providing through the tube intermittent pulses of air during the inserting step.

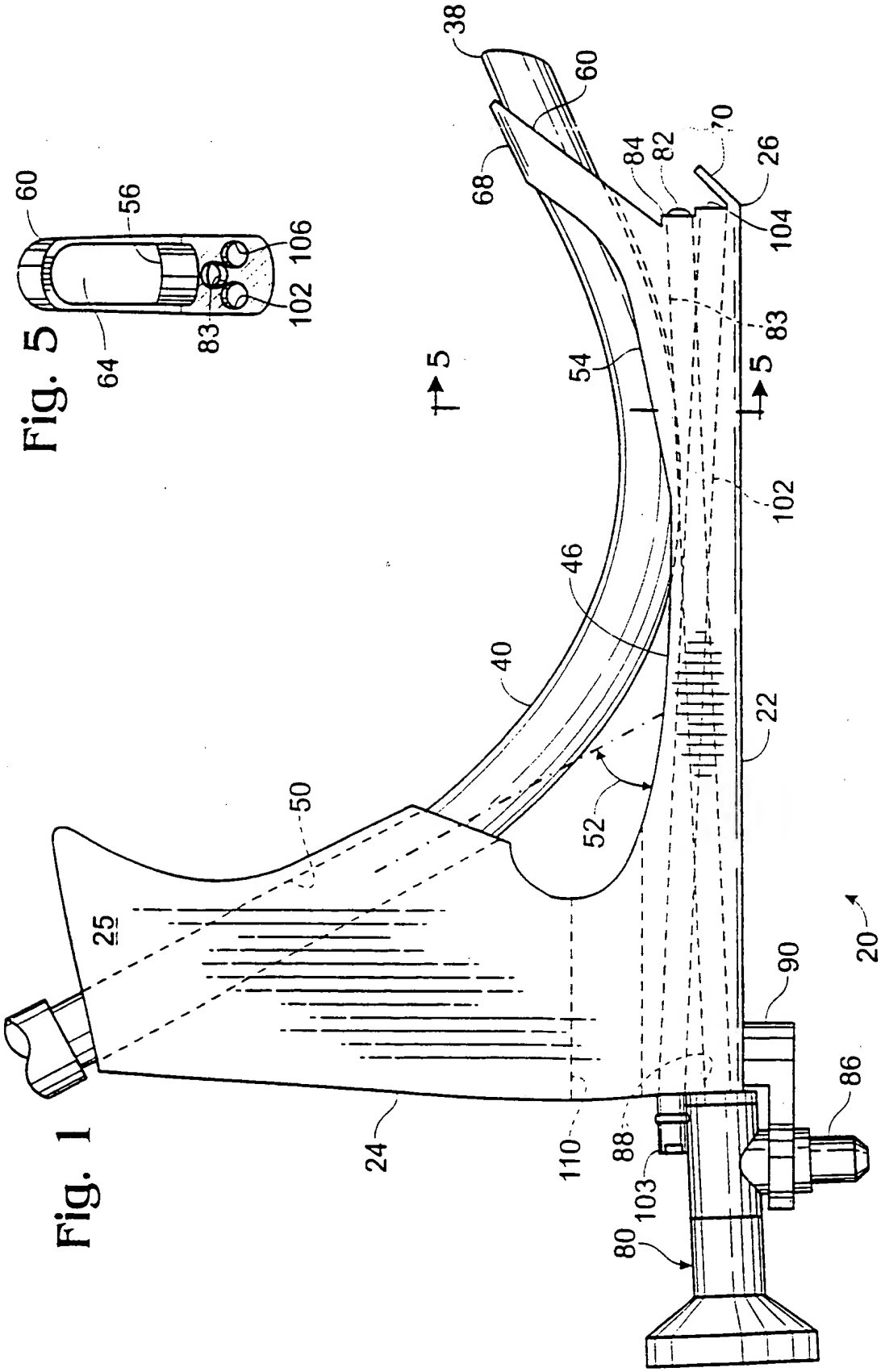
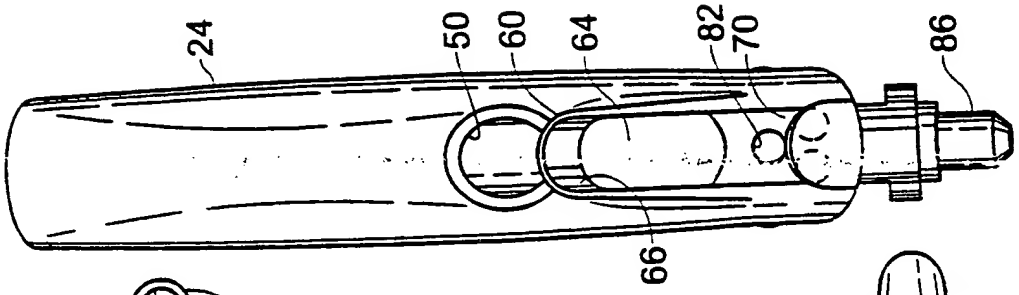


Fig. 1

Fig. 5

Fig. 2



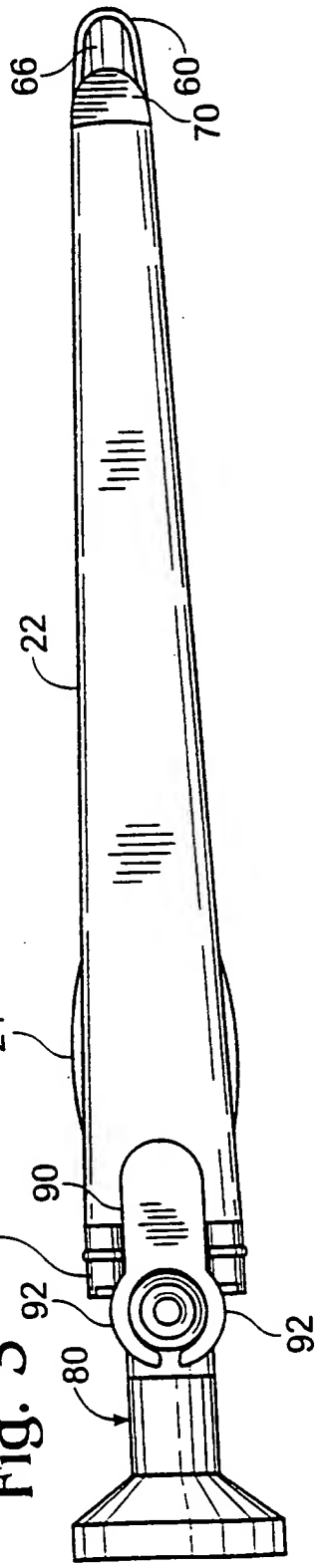


Fig. 3

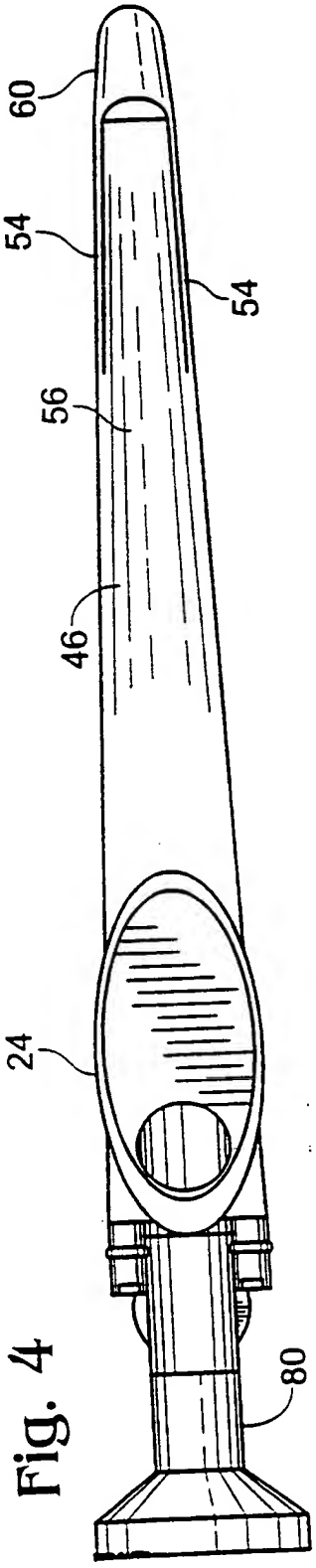


Fig. 4

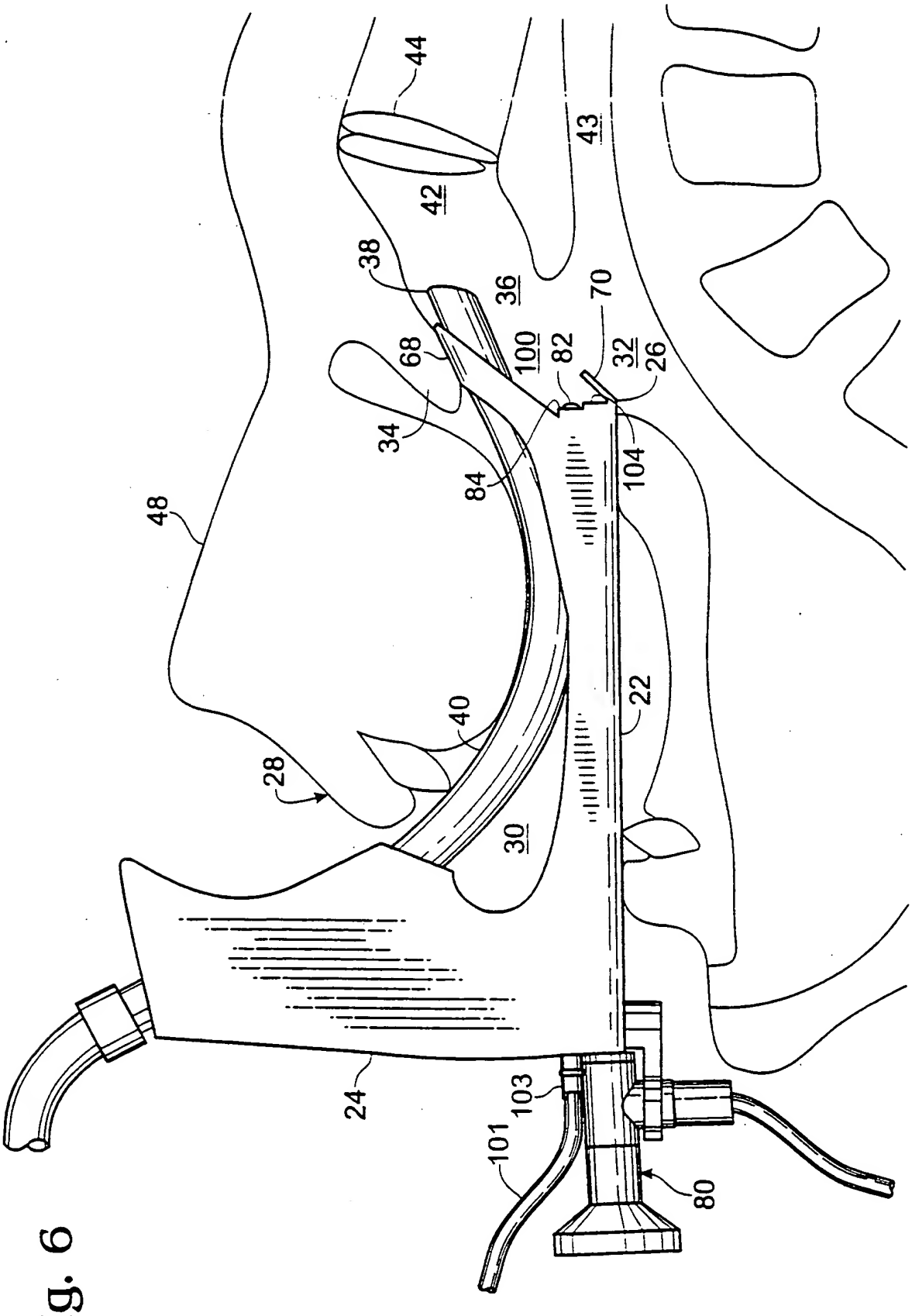


Fig. 6

Fig. 7

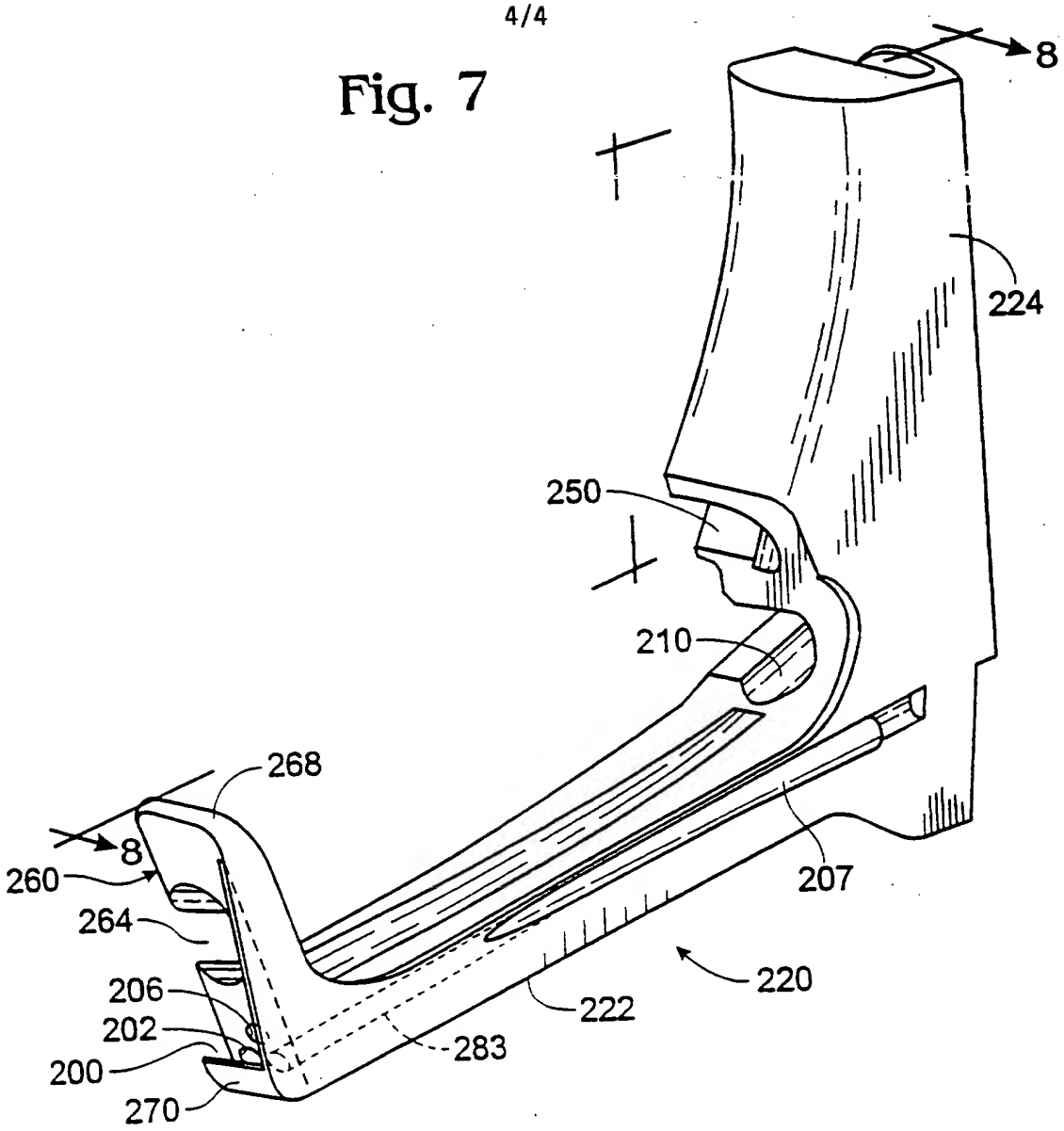
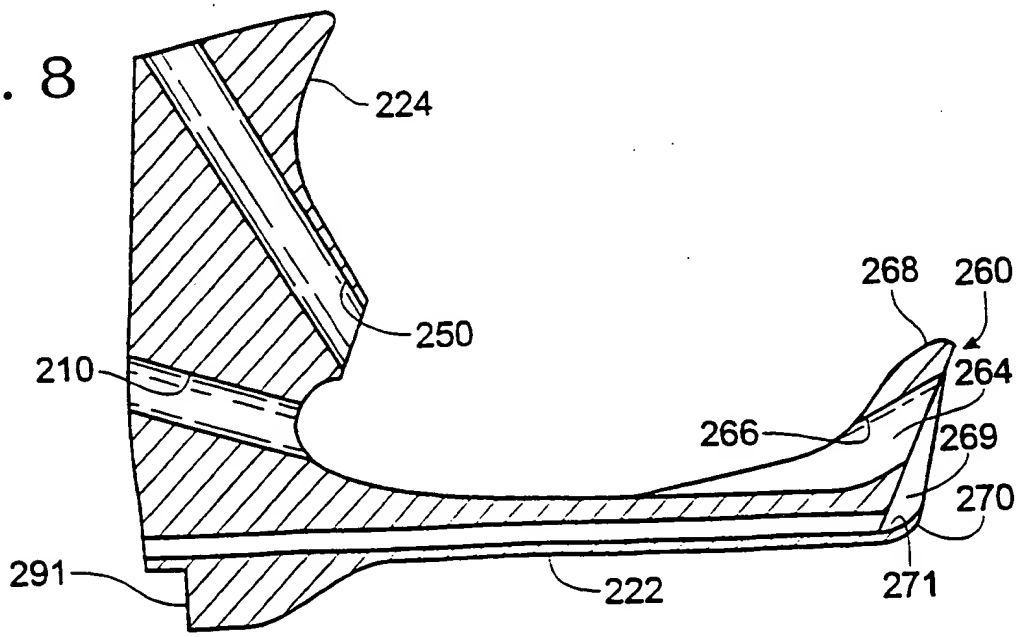


Fig. 8



INTERNATIONAL SEARCH REPORT

Interna al Application No
PCT/CA 98/01094

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61B1/267

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 498 231 A (K. FRANICEVIC) 12 March 1996	1-4,7
X	see column 1, line 50 - column 2, line 2	11,12
A	see column 2, line 49 - column 3, line 65 see column 4, line 23 - line 52	5,16,18

X	US 5 431 152 A (G.H. FLAM ET AL.) 11 July 1995	1-7,9
X	see column 3, line 43 - line 63	15,18-21
A	see column 4, line 17 - line 51 see column 5, line 60 - column 6, line 47 see column 7, line 12 - column 9, line 5	8,10,11

X	US 5 603 688 A (M.S. UPSHER) 18 February 1997	1-6,11
X	see column 1, line 12 - line 20	16,18,20
A	see column 3, line 36 - line 57	7,12,21
A	see column 4, line 9 - column 5, line 18	22

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
30 March 1999	07/04/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Rieb, K.D.

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INTERNATIONAL SEARCH REPORT

Interna. ..l Application No
PCT/CA 98/01094

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 645 519 A (J.S. LEE ET AL.) 8 July 1997	1-6,9
X	see column 8, line 18 - line 56	11-15
X	see column 9, line 15 - line 65	18,19
A	see column 10, line 14 - column 11, line 22	7,17,22

P,X	WO 98 41137 A (PARKER MEDICAL LTD.) 24 September 1998	1-7,9
P,X	see page 7, line 10 - page 8, line 7	10-13
P,X	see page 11, line 18 - page 13, line 13	18-21

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Internal Application No
PCT/CA 98/01094

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5498231 A	12-03-1996	NONE	
US 5431152 A	11-07-1995	US 5607386 A	04-03-1997
US 5603688 A	18-02-1997	NONE	
US 5645519 A	08-07-1997	US 5800342 A	01-09-1998
		US 5840013 A	24-11-1998
WO 9841137 A	24-09-1998	US 5845634 A	08-12-1998
		AU 6550498 A	12-10-1998